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A FIBERGLASS CAGE FOR REARING BARK BEETLES IN SMALL LOG SECTIONS

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ABSTRACT

Construction of a fiberglass cage, consisting of a lid and tapered cylindrical container portion that proved satisfactory for rearing bark beetles, is described. The cage is strong, lightweight and, despite rough handling, retains its original shape and the lid its insect-tight seal.

Laboratory study of bark beetles often requires specialized rearing containers, such as those described by Germain and Wygant[2] and Clark and Osgood.[3] A cylindrical fiberglass cage that proved to be highly satisfactory for rearing the pine engraver, *Ips pini* (Say), in an environmental chamber is shown in figure 1.[4]

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[1] Associate Entomologist, stationed in Moscow, Idaho, at Forestry Sciences Laboratory, maintained in cooperation with the University of Idaho. The author gratefully acknowledges the help of Robert D. Oakes in preparation of figure 3.

[2] Charles J. Germain and Noel D. Wygant. A cylindrical screened cage for rearing bark beetles. U.S. Forest Serv. Res. Note RM-87. 1967.

[3] E. W. Clark and E. A. Osgood, Jr. An emergence container for recovering southern pine beetles from infested bolts. J. Econ. Entomol. 57:783. 1964.

[4] Cage was constructed by Whitmire Fiberglass, Evaro, Mont. Mention of proprietary products does not necessarily imply its endorsement by the U.S. Department of Agriculture.

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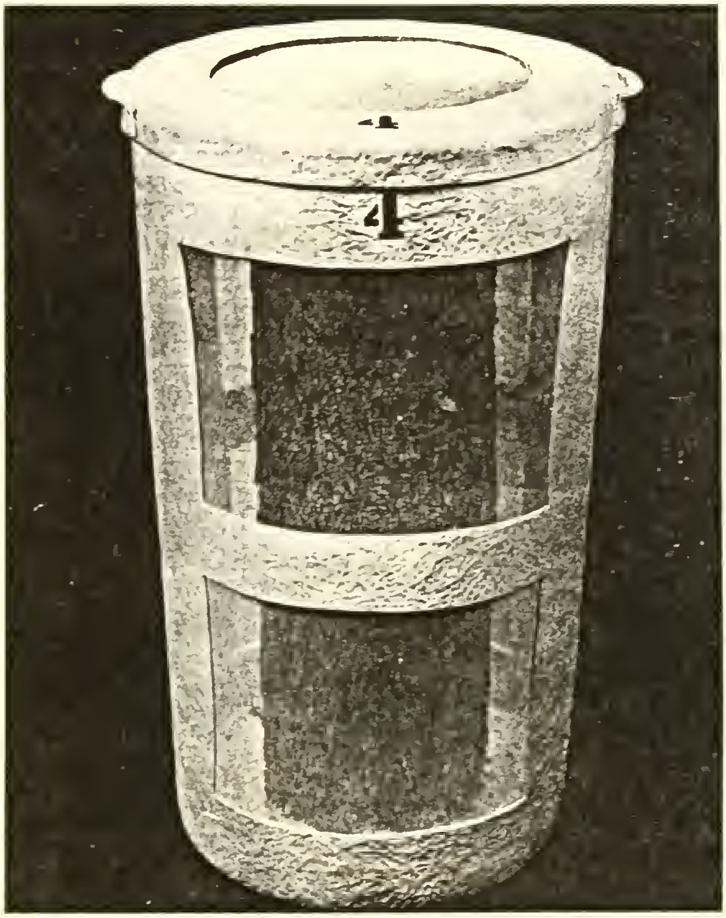

Figure 1.--Fiberglass cage containing log section infested by pine engraver beetles.

MATERIALS AND SPECIFICATIONS

The cage consists of a lid and a tapered cylindrical container (fig. 2). Dimensions and construction details are illustrated in figure 3. The container portion was constructed by either the "hand lay-up" or catalyst injection gun method. For the "hand lay-up" method, a 2-oz. soluble glass mat[5] was formed around a wooden mold sprayed with a white finishing resin.[6] When the mat was in place, a coat of general purpose polyester laminating resin was applied. An injection gun was used to spray the fiberglass and the laminating resin directly over the white finishing resin on later models. The "hand lay-up" method provides greater control of wall thickness, which can vary from 1/16 to 1/8 in., but is slower and more costly.

The cage bottom consisted of a plywood core 10 in. in diameter and 1/2 in. thick A carriage bolt, 3 in. long and 1/4 in. in diameter, that protruded through the center was sealed in 1/4-in. layers of glass mat and resin on the cage bottom. The plywood provided additional rigidity and sufficient thickness to hold the carriage bolt in place.

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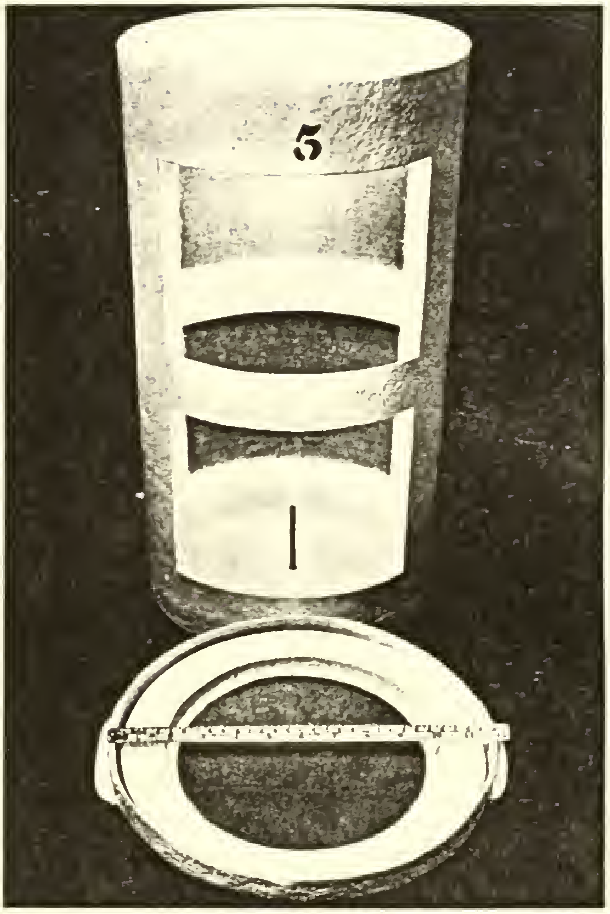
[5] Binder Glass Mat, a product of American Cyanamid Co.

[6] Selectron 587-2, a white gel coat resin, manufactured by Pittsburgh Plate Glass Co., Pittsburgh, Pa.

Figure 2.--Fiberglass cage from which lid has been removed to show construction details.



All cage lids were constructed by the "hand lay-up" method to insure a proper fit. This method was also used to attach two handles to the lid (fig. 2). A 1½-in.-wide by 1/2-in.-thick plywood ring, 11¼ in. in outside diameter, served as the base for the coating of glass mat and resin. The outside lip of the lid overlapped the top edge of the container portion by 3/4 in. The lid was fitted snugly by filing or sanding the top edge of the container.

A saber saw, fitted with a fine-toothed blade for cutting plastic, was used to make openings in the lid and in the sides of the cage (fig. 2). Each of the four openings in the cage walls measured 6½ in. by 9 in., while the opening in the lid was 10 in. in diameter. These openings were covered by a plastic monofilament 32- by 32-mesh screen[7] and affixed to the inside cage wall by a clear waterproof silicon base sealant.[7] Cages cost about $18.00 in 1970.

ADVANTAGES

Fiberglass provides several advantages in cage construction not obtainable from some other materials. It is strong, lightweight, and easily cut and sanded. Because of the resiliency of fiberglass, the cage can be squeezed or bent during handling, and yet retain its original shape and the insect-tight seal of its lid. The white finishing resin interior bonds to the fiberglass wall producing resistance to chipping and abrasion that is superior to paints. Odors emitted by the curing resin or the plastic screen dissipated rapidly and apparently had no effect on the beetles.

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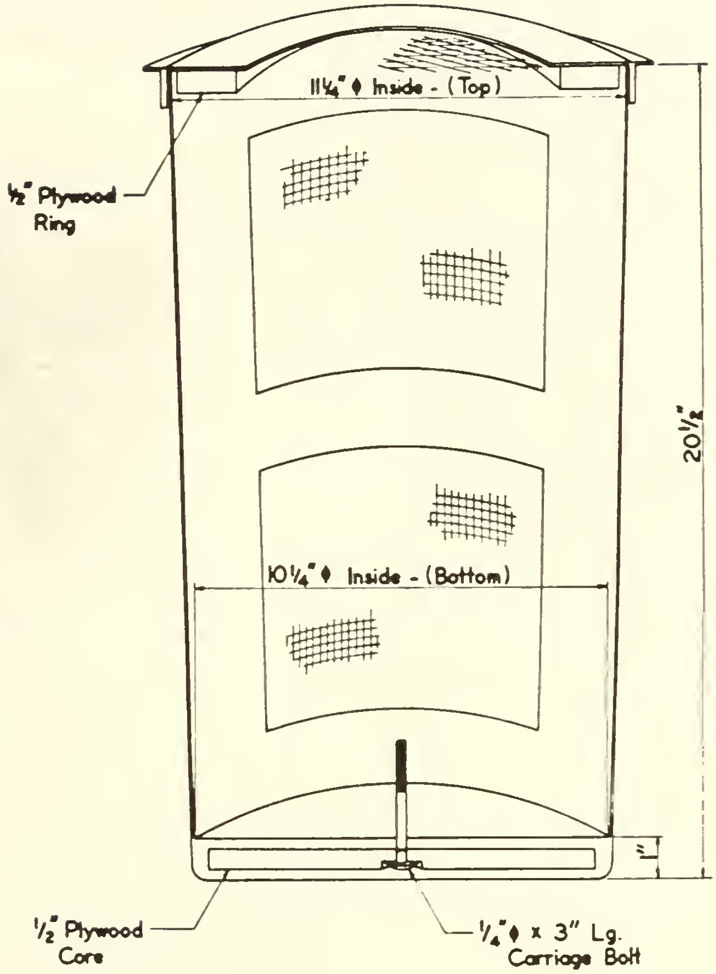
[7] Manufactured by Dow Corning Corp., Midland, Mich.

Figure 3.--Cross section of fiberglass cage showing dimensions.



The cage can accommodate a tree bole section 18 in. long and 8 in. in diameter. Five screened openings permit observations of the contents and, at the same time, allow moisture to dissipate. The lid is insect-tight, but it can easily be removed to introduce or to collect beetles. The absence of corners and the white interior aid collection of insects. The enclosed bole section is steadied by inserting the carriage bolt protruding from the cage bottom into a hole bored into the center of the bole. Space needed for storage of cages was minimized by nesting the tapered containers.

APPLICATION

The cage is suitable for rearing bark beetles that breed in small logs. Parent *I. pini* beetles were introduced into cages containing green stem sections which they infested. Emerging progeny tended to avoid the smooth cage walls and concentrated on the screened openings. Consequently, they were easily collected by sliding a container along the screen. Beetles obtained were free of injuries, which are common in jar-type light traps despite the use of shredded paper for footing. However, a container and lid left without screened openings could be fitted with a jar light trap if one were required.

The cage might also be adapted for rearing insects dependent on small potted plants. The drainage hole in the bottom of the pot could be placed over the carriage bolt protruding from the bottom of the cage to stabilize the plant.

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